

## CLAIMS

1 1. A method of producing constructed fares that includes  
2 an arbitrary added to a published fare, said method executed in a  
3 computer system, the method comprising:

4 determining interior cities that appear with gateway  
5 cities in arbitraries for the airline;

6 searching for gateway cities corresponding to the  
7 determined interior cities appearing in the arbitraries; and

8 applying an arbitrary corresponding to one of the  
9 interior cities to a published fare involving one of the gateway  
10 cities to produce the constructed fare.

1 2. The method of claim 1 wherein determining interior  
2 cities comprises:

3 accessing a hash table by an airline, interior-city  
4 pair to return a list of gateway cities for which an airline has  
5 arbitraries that specify the interior city.

1 3. The method of claim 2 wherein accessing a hash table  
2 returns the list in constant time.

1 4. The method of claim 1 wherein searching for gateway  
2 cities comprises:

3 accessing a hash table by an airline, gateway pair to  
4 return a list of gateway cities that an airline publishes fares  
5 from the determined gateway to another gateway city.

1 5. The method of claim 1 wherein determining interior  
2 cities comprises:

3 accessing a first hash table by an airline, interior-  
4 city pair to return a list of gateway cities for which an airline  
5 has arbitraries that specify the interior city; and

6 wherein searching for gateway cities comprises:

7       accessing a second hash table by an airline, gateway  
8 pair to return a second list of gateway cities that an airline  
9 publishes fares from the determined gateway to another gateway  
10 city.

1       6.       The method of claim 5 wherein accessing the first and  
2 second hash table returns the lists in constant time.

1       7.       The method of claim 1 wherein applying arbitraries  
2 further comprises:

3       evaluating records from fare construction tables to  
4 determine whether the constructed fare is a valid constructed  
5 fare.

1       8.       The method of claim 1 wherein the method is conditioned  
2 to allow any one or more of an airline code, interior city a  
3 first gateway city a second gateway city, or fare-basis to vary.

1       9.       The method of claim 7 wherein testing entries further  
2 comprises:

3       determining if an entry in a construction table was  
4 memoized before accessing the construction table; and

5       if the entry was memoized, retrieving an answer from a  
6 store of memoized entries to apply to the constructed fare.

1       10.       The method of claim 1 wherein the constructed fare is a  
2 two component constructed fare.

1       11.       The method of claim 1, further comprising:

2       determining a second set of interior cities that appear  
3 with a second gateway city in the published fare for the airline;

4           applying a second interior city from the second set of  
5 interior cities to the constructed fare to produce a three  
6 component constructed fare.

1       12.       The method of claim 1 wherein the method is performed  
2 over all determined interior cities and all gateways.

1       13.       The method of claim 1 wherein the method is performed  
2 over all airlines.

1       14.       A method of producing a set of constructed  
2 international fares for an airline, the method executed in a  
3 computer system and the method comprising:  
4           determining interior cities that appear with gateway  
5 cities in arbitraries for the airline;  
6           searching for gateway cities corresponding to the  
7 determined interior cities appearing in the arbitraries; and  
8           applying each arbitrary corresponding to each of the  
9 determined interior cities to published fares involving the  
10 gateway cities to produce the set of constructed fares.

1       15.       The method of claim 14 wherein the set of constructed  
2 fares are two component constructed fares.

1       16.       The method of claim 14 further comprising:  
2           determining a second set of interior cities that appear  
3 with second gateway cities in the published fares.

1       17.       The method of claim 15 wherein the set of constructed  
2 fares is a first set of constructed fares and the method further  
3 comprises:  
4           applying each arbitrary corresponding to each of the

5 determined second set of interior cities to the first set of  
6 constructed fares to produce a second set of constructed fares.

1 18. The method of claim 14 wherein the first set of  
2 constructed fares are two component constructed fares and the  
3 second set of constructed fares are three component constructed  
4 fares.

1 19. The method of claim 14 further comprising:  
2 evaluating entries in fare construction tables to  
3 determine whether constructed fares in the set of constructed  
4 fares are valid constructed fares; and  
5 returning the valid constructed fares as the set of  
6 constructed fares.

1 20. The method of claim 19 wherein evaluating entries  
2 further comprises:  
3 determining if an entry in a fare construction table  
4 was memoized before accessing the fare construction table; and  
5 if the entry was memoized, retrieving an answer from a  
6 store of memoized entries to apply to the constructed fare.

1 21. The method of claim 14 wherein determining interior  
2 cities comprises:  
3 accessing a first hash table by an airline, interior-  
4 city pair to return a list of gateway cities for which an airline  
5 has arbitraries that specify the interior city; and  
6 wherein searching for gateway cities comprises:  
7 accessing a second hash table by an airline, gateway  
8 pair to return a second list of gateway cities that an airline  
9 publishes fares from the determined gateway to another gateway  
10 city.

1 22. A computer program product residing on a computer  
2 readable medium, for producing constructed fares that includes an  
3 arbitrary added to a published fare, comprising instructions for  
4 causing a computer system to:

5 determine interior cities that appear with gateway  
6 cities in arbitraries for the airline;

7 search for gateway cities corresponding to the  
8 determined interior cities appearing in the arbitraries; and

9 apply an arbitrary corresponding to one of the interior  
10 cities to a published fare involving one of the gateway cities to  
11 produce the constructed fare.

1 23. The computer program product of claim 22 wherein  
2 instructions that cause a computer to determine interior cities  
3 comprises:

4 accessing a hash table by an airline, interior-city  
5 pair to return a list of gateway cities for which an airline has  
6 arbitraries that specify the interior city.

1 24. The computer program product of claim 23 wherein  
2 instructions that cause a computer to access a hash table returns  
3 the list in constant time.

1 25. The computer program product of claim 22 wherein  
2 instructions that cause a computer to search for gateway cities  
3 comprises instructions that cause a computer to:

4 access a hash table by an airline, gateway pair to  
5 return a list of gateway cities that an airline publishes fares  
6 from the determined gateway to another gateway city.

1 26. The computer program product of claim 22 wherein  
2 instructions that cause a computer to determine interior cities  
3 comprises instructions that cause a computer to:

4 access a first hash table by an airline, interior-city  
5 pair to return a list of gateway cities for which an airline has  
6 arbitraries that specify the interior city; and

7 wherein instructions that cause a computer to  
8 search for gateway cities comprises instructions that cause a  
9 computer to:

10 access a second hash table by an airline, gateway  
11 pair to return a second list of gateway cities that an airline  
12 publishes fares from the determined gateway to another gateway  
13 city.

1 27. The computer program product of claim 26 wherein  
2 instructions that cause a computer to access the first and second  
3 hash table returns the lists in constant time.

1 28. The computer program product of claim 22 wherein  
2 instructions that cause a computer to apply arbitraries further  
3 comprises instructions that cause a computer to:

4 test entries in construction tables to determine  
5 whether the constructed fare is a valid constructed fare.

1 29. The computer program product of claim 28 wherein  
2 instructions that cause a computer to test entries further  
3 comprises instructions that cause a computer to:

4 determine if an entry in a construction table was  
5 memoized before accessing the construction table; and

6 if the entry was memoized, retrieve an answer from a  
7 store of memoized entries to apply to the constructed fare.

1 30. The computer program product of claim 22 wherein the  
2 constructed fare is a two component constructed fare.

1 31. The computer program product of claim 22 wherein the  
2 computer program product is conditioned to allow any one or more  
3 of an airline code, interior city, a first gateway city, a second  
4 gateway city, or fare-basis to vary.

1 32. The computer program product of claim 22, further  
2 comprising instructions that cause a computer to:  
3 determine a second set of interior cities that appear  
4 with a second gateway city in the published fare for the airline;  
5 and

6 apply a second interior city from the second set of  
7 interior cities to the constructed fare to produce a three  
8 component constructed fare.

1 33. The computer program product of claim 22 wherein the  
2 computer program product is executed over all determined interior  
3 cities and all gateways.

1 34. The computer program product of claim 22 wherein the  
2 computer program product is executed over all airlines.

3 35. A computer program product for producing a set of  
4 constructed international fares for an airline, the computer  
5 program product residing on a computer readable medium and  
6 comprising instructions that cause a computer to:

7 determine interior cities that appear with gateway  
8 cities in arbitraries for the airline;

9 search for gateway cities corresponding to the  
10 determined interior cities appearing in the arbitraries; and

11           apply each arbitrary corresponding to each of the  
12 determined interior cities to published fares involving the  
13 gateway cities to produce the set of constructed fares.

1     36.       The computer program product of claim 35 wherein the  
2 set of constructed fares are two component constructed fares.

1     37.       The computer program product of claim 35 further  
2 comprising instructions that cause a computer to:  
3           determine a second set of interior cities that appear  
4 with second gateway cities in the published fares.

1     38.       The computer program product of claim 36 wherein the  
2 set of constructed fares is a first set of constructed fares, and  
3 the computer program product further comprises instructions that  
4 cause a computer to:

5           apply each arbitrary corresponding to each of the  
6 determined second set of interior cities to the first set of  
7 constructed fares to produce a second set of constructed fares.

1     39.       The computer program product of claim 35 wherein the  
2 first set of constructed fares are two component constructed  
3 fares and the second set of constructed fares are three component  
4 constructed fares.

1     40.       The computer program product of claim 35 further  
2 comprising instructions that cause a computer to:  
3           evaluate entries in fare construction tables to  
4 determine whether constructed fares in the set of constructed  
5 fares are valid constructed fares; and  
6           return the valid constructed fares as the set of  
7 constructed fares.



8 41. The computer program product of claim 40 wherein  
9 instructions that cause a computer to evaluate entries further  
10 comprises instructions that cause a computer to:  
11 determine if an entry in a fare construction table was  
12 memoized before accessing the fare construction table; and  
13 if the entry was memoized, retrieve an answer from a  
14 store of memoized entries to apply to the constructed fare.

1 42. The computer program product of claim 35 wherein  
2 instructions that cause a computer to determine interior cities  
3 comprises instructions that cause a computer to:  
4 access a first hash table by an airline, interior-city  
5 pair to return a list of gateway cities for which an airline has  
6 arbitraries that specify the interior city; and  
7 wherein instructions that cause a computer to  
8 search for gateway cities comprises instructions that cause a  
9 computer to:  
10 access a second hash table by an airline, gateway  
11 pair to return a second list of gateway cities that an airline  
12 publishes fares from the determined gateway to another gateway  
13 city.

1 43. A computer system comprising:  
2 a processor;  
3 a memory for storing instructions executed by the  
4 processor; and  
5 a storage medium storing a computer program product for  
6 producing a set of constructed international fares for an  
7 airline, the computer program product comprising instructions  
8 that cause the processor to:  
9 determine interior cities that appear with gateway  
10 cities in arbitraries for the airline;

11 search for gateway cities corresponding to the  
12 determined interior cities appearing in the  
13 arbitraries; and  
14 apply each arbitrary corresponding to each of the  
15 determined interior cities to published fares involving  
16 the gateway cities to produce the set of constructed  
17 fares.

1 44. The computer system of claim 43 wherein the system is a  
2 stand-alone computer.

1 45. The computer system of claim 43 wherein the system is a  
2 server computer in a networked, client-server computer system.

1 46. The computer system of claim 43 wherein the system is a  
2 client computer in a networked, client-server computer system.

1 47. A method of evaluating constructed fares against  
2 construction tables comprises:  
3 forming a query to obtain a record from a construction  
4 table to evaluate the validity of a constructed fare;  
5 determining whether the query has been stored in a  
6 store of past queries and associated answers;  
7 if the query has been stored, retrieving the answer  
8 from the store to evaluate the constructed fare, otherwise  
9 retrieving the record from a remote database;  
10 evaluating the constructed fare against the record; and  
11 storing an answer from evaluating the constructed fare  
12 for future references.

1 48. The method of claim 47 wherein the store is a

2 memoization store.

1 49. The method of claim 47 wherein once the answer for a  
2 certain query has been stored, the procedure does not need to be  
3 run again on that query unless the record changes.

1 50. The method of claim 47 wherein the construction table  
2 is a so called ATPCO P02 table.

1 51. The method of claim 47 wherein the construction table  
2 is a so called ATPCO P04 table.